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DAHL, T.		
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CKSON, D.T.		
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ESTER, A.W.		
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DONALD, M.M.		
KENNA, F.G.		
NTROSE, J.K.		
RGAN, R.V.		
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ZUTO, V.M.		
SING, T.L.		
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IGER, S.G.	X	
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MBROSE, M.A.	X	
ENTZEN, K.	X	
REEN, A.G.	X	
LLOWELL, L.J.	X	
TEM, N.C.	X	X
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EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC.
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April 19, 1995

95-RF-03474

Jessie M. Roberson
Assistant Manager for
Environmental Restoration Program Division
DOE/RFFO

ENVIRONMENTAL RESTORATION PROGRAM DIVISION (ERPD) SUBPROJECT FACT SHEET PEG-95-08 (PREVIOUSLY 95-20) SUBMITTAL - SGS-132-95

Action: None required

Please find enclosed a copy of the semi-annual update of the ERPD Subproject Fact Sheets, which is a Program Execution Guidance milestone. This correspondence serves as official transmittal and fulfillment of the Program Execution Guidance milestone.

If you have any questions, please call Nancy Stem, Administrative Services, on X8632.

A R Keith

S. G. Stiger, Director
Environmental Restoration Program Division

DGB:cms

Orig. and 1 cc - J. M. Roberson

Enclosure:
As Stated

cc:
L. L. O' Mary - DOE/RFFO
K. Klein - " "
M. N. Silverman - " "

ROCKY FLATS ENVIRONMENTAL RESTORATION

QUARTERLY SUBPROJECT FACT SHEETS

March 1995

Program Execution Guidance
Milestone #95-20

INTERAGENCY AGREEMENT

Introduction

In order to establish a common basis of understanding and to integrate the requirements of federal regulators for the cleanup of Rocky Flats Environmental Technology Site with those of the Colorado Department of Public Health and Environment (CDPHE), an Interagency Agreement (IAG) was negotiated between the United States Department of Energy (DOE), Environmental Protection Agency (EPA), and CDPHE and signed on January 22, 1991. The purpose of the IAG is to establish a legally enforceable framework to facilitate coordination of cleanup and oversight efforts and to standardize requirements. The agreement establishes specific milestones and time frames for remedial actions as well as penalties for noncompliance with the agreement. The IAG document is available to the public at a number of information repositories.

The IAG establishes the parameters for cleanup of potential radioactive, hazardous, and mixed waste contamination resulting from past operations at 177 Individual Hazardous Substance Sites (IHSSs) at Rocky Flats Environmental Technology Site. The goal of the Rocky Flats Environmental Technology Site Environmental Restoration Program is to remediate these sites in a manner that protects the health and safety of the public, onsite workers, and the environment.

Operable Unit Structure

The Rocky Flats Environmental Technology Site, in consultation with EPA and CDPHE and in response to public comment, organized the original 177 inactive IHSSs into 16 operable units (OUs).

Three factors were considered in assigning an IHSS to a particular OU: (1) geographic location, (2) type of contaminant involved, and (3) relative priority of the IHSS. Given these factors, there is considerable overlap of the OU boundaries. As provided for in the IAG, sites may be added to the IHSS list if previously unidentified potential contamination is discovered or sites may be removed as technical analysis indicates that a site does not present a risk to public health or the environment.

The priorities for Rocky Flats Environmental Technology Site OUs were established through the IAG. DOE and EG&G technical staff, EPA, and CDPHE initially prioritized the OUs on the basis of available technical information; however, subsequent public comment on the IAG resulted in modification of the priorities. Assessment, characterization, and remedial activities for IHSSs are carried out by OU, and the OUs form the basis for planning, scheduling, budgeting, and prioritizing environmental restoration activities. Contamination at the OUs is being assessed, and clean-up activities are being undertaken, with higher risk sites being addressed before lower risk sites.

Administration of the IAG

The IAG framework established the joint EPA, CDPHE, and DOE agreement for the administration of Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remediation at Rocky Flats Environmental Technology Site. DOE recognized that the two regulatory agencies could potentially impose conflicting requirements on DOE, since an overlap of respective authorities exists under RCRA and CERCLA.

For purposes of the IAG, EPA and CDPHE established a joint review of each OU. The lead regulatory agency is assigned according to the RCRA or CERCLA designation of that OU. (Note: The IAG established joint lead agency oversight for OUs 1, 2, and 8.) The agency not assigned direct authority serves as the support regulatory agency. The EPA, CDPHE, and DOE recognize the need for, and the benefits derived from joint regulatory agency review. Table I lists OU designations, OU name, the number of IHSSs, and the lead regulatory agencies for Rocky Flats Environmental Technology Site OUs.

IAG Milestone Schedules

Because the original IAG schedules for the 268 enforceable milestones negotiated in 1990 were based on limited DOE Environmental Restoration (ER) experience, several assumptions regarding work activity scope, durations, and costs have proven to be incorrect and have resulted in increased difficulty in complying with the IAG schedule. In essence, the IAG established fixed schedules covering a period of 12 years for a work scope that was ill defined and is still evolving. In addition, the weapons manufacturing mission of Rocky Flats Environmental Technology Site was terminated in 1992. The new mission is waste management and environmental restoration.

To address this problem, DOE has opened discussions with the regulatory agencies regarding a revision or replacement of the IAG. DOE acknowledges that the IAG should be restructured to reflect the new mission at RFETS and to include a flexible milestone schedule based on a solid technical scope, cost, and schedule baseline. In order to be realistic, the schedule must recognize the federal funding cycle and be responsive to federal budget limitations. In the negotiations, DOE will also propose a revised, accelerated approach to the cleanup of Rocky Flats Environmental Technology Site. This approach may include a re-configuration of OU boundaries, deferring work which is linked to decontamination and decommissioning of buildings, and early cleanup of selected sites.

TABLE I: Summary of Operable Units at Rocky Flats Environmental Technology Site

OU	OU Name/Area	No. of IHSSs	Lead Agency
OU 1*	881 Hillside	11	EPA and CDPHE
OU 2*	903 Pad, Mound, and East Trenches	20	EPA and CDPHE
OU 3	Offsite Areas	4	EPA
OU 4	Solar Evaporation Ponds	2	CDPHE
OU 5	Woman Creek	11	EPA
OU 6	Walnut Creek	19	EPA
OU 7	Present Landfill	4	CDPHE
OU 8*	700 Area	24	EPA and CDPHE
OU 9	Original Process Waste Lines	21	CDPHE
OU 10	Other Outside Closures	14	CDPHE
OU 11	West Spray Field	1	CDPHE
OU 12	400/800 Area	10	EPA
OU 13	100 Area	14	EPA
OU 14	Radioactive Sites	8	EPA
OU 15	Inside Building Closures	7	CDPHE
OU 16	Low-Priority Sites	6	EPA
	TOTAL	**177**	

* Per the IAG, joint EPA/CDPHE oversight has been established.

OPERABLE UNIT 1, 881 HILLSIDE

Introduction

Operable Unit (OU) 1, 881 Hillside, is an element of the United States Department of Energy (DOE) Environmental Restoration (ER) Program at the Rocky Flats Environmental Technology Site in Golden, Colorado.

Description

Isolated areas of the alluvial groundwater at the 881 Hillside Area, located north of Woman Creek in the southeast section of Rocky Flats Environmental Technology Site approximately 1.5 miles from the eastern, outer edge of the plant's buffer zone, was contaminated in the 1960s and 1970s with solvents and radionuclides. The various Individual Hazardous Substance Sites (IHSSs) that make up OU 1 have been investigated and treated as high-priority sites because of potentially elevated concentrations of organic compounds in the near-surface groundwater and the proximity of the contamination to the Woman Creek drainage system which leads to an off-site drinking water supply. Table I lists the IHSSs that comprise OU 1.

Major Contaminants

The major contaminants encountered at the 881 Hillside include volatile organics (TCE and carbon tetrachloride) in groundwater. Plutonium which was found in an isolated location was removed in September 1994.

Description of Work Completed

OU Assessment

A Phase I Remedial Investigation (RI) for the 881 Hillside was completed, and a Draft RI report was submitted to the EPA and CDPHE in 1987. A Phase II RI was also performed in 1987, and results of this investigation were presented to EPA and CDPHE in a draft report in March 1988. These investigations indicated the presence of volatile organic compounds (VOCs) in the shallow (alluvial) groundwater system at the 881 Hillside Area and the presence of volatile and semi-volatile compounds in the soils.

The Final Phase III Resource Conservation and Recovery Act (RCRA) Facilities Investigation (RFI)/RI Work Plan was submitted to EPA and CDPHE in October 1990, and the Phase III RI field work began in August 1991.

Phase III RI field work and the required laboratory sample analysis work and data validation were completed in January 1992. The first draft of the Phase III RI Report was submitted to the regulatory agencies in October 1992. Extensive comments were received from the regulatory agencies and revisions to the document were completed in October 1993. The Final Phase III Report was delivered on November 5, 1993.

Additional comments on the Final RFI/RI Report were received from the EPA and CDPHE in February 1994. These comments were incorporated into the Final Revised Phase III RFI/RI Report which was delivered to the regulatory agencies on June 15, 1994. The Corrective Measures Study/Feasibility Study (CMS/FS) began in the second half of FY92 and will be completed in FY95. The Final CMS/FS was transmitted to the regulatory agencies on February 13, 1995. Comments on the Draft CMS/FS were received from the EPA on October 7, 1994, and the CDPHE's comments were received on November 1, 1994. The first Draft Proposed Plan was delivered to the regulatory agencies on November 22, 1994. Table II lists the IAG milestones completed through FY94.

Interim Remedial Action

DOE proposed an Interim Measure/Interim Remedial Action (IM/IRA) to minimize the release of hazardous substances from the 881 Hillside area while the assessment process and selection of the final remedial action are being conducted. The IM/IRA prevents any potentially contaminated groundwater from reaching Woman Creek. The IM/IRA selected by DOE, with input and

review by the public, and approved by EPA and CDPHE, encompassed the construction of an underground drainage system called a French drain which was designed to intercept and contain contaminated near-surface groundwater from OU 1. In addition to the French drain, the IM/IRA also included the collection of water from the Building 881 footing drain and a collection well. The collected water is transferred to an on-site treatment facility for removal of VOCs, radionuclides, and metals. After treatment and testing, the water is released onsite into the South Interceptor Ditch. Water collected from this ditch then undergoes a secondary analysis prior to release. Construction of the treatment building, which began in November 1989, and excavation of the French drain, which began in October 1991, are now complete, and the facility is in full operation. An Environmental Assessment (EA) for the planned OU 1 IM/IRA was completed in 1990.

Groundwater collected by the French drain and the collection well is undergoing ultraviolet (UV)/peroxide treatment to remove VOCs and treatment by an ion exchange system to remove the metals and radionuclides. Through the end of FY93, the OU 1 IM/IRA collected, treated, and released over 2.5 million gallons of groundwater from the 881 Hillside Area. The primary source of water is the footing drain for Building 881. It has been determined that this water meets Safe Drinking Act standards. A request has been approved to discontinue collection and treatment, and collection was discontinued in 1995.

An Accelerated Response Action (ARA) was completed on October 3, 1994, to remove radionuclide-contaminated soils (hot spots) at six specific locations within IHSS 119.1 and near IHSS 119.2. Contaminated soils approximately three feet in diameter and approximately two feet in depth at each of the six locations contain substantial activities of either plutonium, americium, or uranium and traces of several organic compounds. The ARA included excavating, containerizing, and storing the contaminated soils from these hot spots. The action described above significantly reduces potential risks to workers and the public posed by the radionuclides present in the hot spots. The ARA was consistent with long-term clean-up plans for OU 1 because it permanently reduces health risks and the contamination migration potential at OU 1. The EPA and CDPHE sanctioned the ARA with their approval of the Final Proposed Action Memorandum, *Hot Spot Removal - Rocky Flats Environmental Technology Site Environmental Technology Site (OU 1).* Waste drum hot spot sample analytical results are due back in December 1994, and validation of the data is expected to be complete in January 1995. It is anticipated that the waste drums will be shipped offsite in March 1995.

Future Plans

The RI/FS process, which will lead to a Record of Decision (ROD) on the final remedy for OU 1, will continue. Based on the results of the RFI/RI and CMS/FS, the scope of the Remedial Action (RA) will be determined in the ROD. Operation of the IM/IRA to treat groundwater will continue until it is integrated into the final remedial action. Table III lists the OU 1 IAG milestones planned for FY95.

TABLE I: OU 1 Individual Hazardous Substance Sites

IHSS	Site Name
102	Oil Sludge Pit
103	Chemical Burial Area
104	Liquid Dumping Pit
105.1	Out-of-Service Fuel Tank - West Tank
105.2	Out-of-Service Fuel Tank - East Tank
106	Outfall
107	Hillside Oil Leak
119.1	Multiple Solvent Spills - West Area
119.2	Multiple Solvent Spills - East Area
130	Radioactive Site - 800 Area Site #1
145	Sanitary Waste Line Leak

TABLE II: OU 1 IAG Milestones Completed Through FY94

IAG Milestone Description	IAG Completion Original Date	Extension Date	Date Accomplished
Submit Draft Proposed IM/IRA Decision Document	September 18, 1989		September 18, 1989
Submit Proposed IM/IRA Decision Document	October 6, 1989		October 6, 1989
Submit Final IM/IRA Decision Document	January 5, 1990		January 5, 1990
Begin Phase I-A IM/IRA Construction	January 15, 1990		January 15, 1990
Begin Phase I-B IM/IRA Construction	October 8, 1990		September 28, 1990
Submit IM/IRA Implementation Document	February 22, 1991		February 22, 1991
Begin Phase II-A IM/IRA Construction	April 1, 1991		April 1, 1991
Begin IM/IRA Testing	August 5, 1991		August 5, 1991
Begin Phase II-B IM/IRA Construction	September 3, 1991		September 3, 1991
Complete IM/IRA Construction	March 2, 1992	April 13, 1992	April 13, 1992
Submit Draft Phase III RFI/RI Work Plan	February 6, 1990		February 6, 1990
Submit Final Phase III RFI/RI Work Plan	October 30, 1990		October 31, 1990
Submit Draft Phase III RFI/RI Report	July 30, 1992	October 28, 1992	October 28, 1992
Submit Final Phase III RFI/RI Report	September 27, 1993		November 5, 1994
Submit Final Revised Phase III RFI/RI Report	January 4, 1993		June 15, 1994
Submit Draft CMS/FS Report	March 31, 1993		August 25, 1994
Submit Draft PP	September 27, 1993		November 22, 1994

TABLE III: OU 1 IAG Milestones Planned for FY95

IAG Milestone Description	IAG Completion Original Date	Extension Date
Submit Final CMS/FS Report	September 27, 1993	December 22, 1994
Submit Final PP	January 4, 1994	March 27, 1995
Submit Draft Responsiveness Summary	May 6, 1994	July 24, 1995
Submit Final Responsiveness Summary	August 3, 1994	October 23, 1995
Submit Draft CAD/ROD	August 3, 1994	October 23, 1995
Submit Final CAD/ROD	November 1, 1994	January 22, 1996

OPERABLE UNIT 2, 903 PAD, MOUND, AND EAST TRENCHES

Introduction

Operable Unit (OU) 2, 903 Pad, Mound, and East Trenches, is an element of the United States DOE Environmental Restoration Program at the Rocky Flats Environmental Technology Site in Golden, Colorado.

Description

The 903 Pad, Mound, and East Trenches areas are located on the east side of the Rocky Flats Environmental Technology Site Industrial Area (IA). The 20 Individual Hazardous Substance Sites (IHSSs) which comprise OU 2 are listed in Table I.

The contamination at the 903 Pad and Mound areas is attributed to the storage during the 1950s and 1960s of drums containing waste that corroded over time and allowed hazardous and radioactive material to leak into the surrounding soil. Additional dispersion has been caused by wind during drum removal and soil movement activities. The East Trenches Area was used for disposal of plutonium and uranium-contaminated waste and sanitary sewage sludge from 1954 to 1968. Two areas near the trenches were used for spray irrigation of sewage treatment plant effluent, some of which may have had contaminants that were not removed by the treatment system.

The major contaminants at the 903 Pad, Mound, and East Trenches area include volatile organic compounds (VOCs) and radionuclides (U, Pu, and Am).

TABLE I: OU 2 Individual Hazardous Substance Sites

IHSS	Site Name	IHSS	Site Name
108	Trench T-1	112	903 Drum Storage Area
109	Trench T-2	113	Mound Area
110	Trench T-3	140	Reactive Metal Destruction
111.1	Trench T-4	153	Oil Burn Pit No. 2
111.2	Trench T-5	154	Pallet Burn Site
111.3	Trench T-6	155	903 Lip Area
111.4	Trench T-7	183	Gas Detoxification Area
111.5	Trench T-8	216.2	East Spray Field - Center Area
111.6	Trench T-9	216.3	East Spray Field - South Area
111.7	Trench T-10		
111.8	Trench T-11		

Description of Work Completed

OU2 Assessment

Remedial Investigation

A Phase I Remedial Investigation (RI) for OU 2 was completed in 1989. Work Plans for the Phase II Alluvial and Bedrock RFI/RIs were approved by the regulatory agencies (EPA and CDPHE) in 1990 and 1991, respectively. These Work Plans describe the boreholes, wells, seismic surveys, hydraulic testing, soil sampling, gamma surveys, and environmental (ecological) evaluation sampling necessary to complete the Phase II RFI/RI.

The Phase II RFI/RI alluvial field activities and laboratory analyses for the alluvial program were completed in the fourth quarter of FY92. The bedrock field work was deferred in FY92 because of other program priorities, and the eventual scope of the bedrock characterization was influenced by the findings of the Alluvial characterization. A revised Bedrock Work Plan which reduced the

number of wells was completed in the first half of FY93. The bedrock field program was completed in the fourth quarter of FY93.

In June 1993, DOE requested a work stoppage, and the regulatory agencies directed DOE to stop work on OUs 1 through 7 for (1) aggregation of RFI/RI data for the purpose of comparing background concentrations to select contaminants of concern (COCs) for the Human Health Risk Assessment (HHRA) and (2) aggregation of data for the purpose of conducting an exposure assessment. Work was stopped until April 15, 1994, when the parties to the IAG reached an agreement that provided guidance on the methodology for data aggregation for the HHRA and Resource Conservation and Recovery Act (RCRA) Facilities Investigation (RFI)/RI Report. The remaining tasks of the Risk Assessment including data evaluation, identification of exposure scenarios, selection of exposure parameters, and ecological effects assessment are proceeding as scheduled. Groundwater and air monitoring are planned to continue into 1995.

A preliminary draft of the Phase II RFI/RI Report excluding the Baseline Risk Assessment (BRA) was submitted to the regulatory agencies for review and comment on December 16, 1993. The RI/RFI Report will provide data for the Corrective Measures Study/Feasibility Study (CMS/FS) in which the final action to remediate contaminated portions of soil, surface water, groundwater, and seeps will be evaluated. CMS/FS work started in October, 1993. The CMS/FS is continuing with initiation of the Programmatic CMS/FS. The Draft RFI/RI Report is scheduled to be submitted to the regulatory agencies on May 30, 1995.

The following is a list of treatability studies:

Chemical Enhanced Steam Stripping
TRU Clear Treatability
Bioremediation
Solvent Extraction
Magnetic Separation
Soil Washing

A Comprehensive Appraisal of Plutonium 239+240 in soils of OUs 1, 2, and 3 was performed. This appraisal will serve as a basis for risk analysis for these OUs. The following is a brief summary of this investigation.

Plutonium contamination of soils in the vicinity of the Rocky Flats Environmental Technology Site Environmental Technology Site near Golden, Colorado, resulted from past outdoor storage practices and subsequent remobilization because of inadequate clean-up practices. Until now, human-health and ecological risk assessments have not been performed because of a lack of sufficient information regarding the spatial extent of Plutonium 239+240 in soils. The purpose of this work was to elucidate the extent of plutonium contamination in surficial soils and to assess the uncertainty associated with the spatial distribution of Plutonium 239+240 around the Rocky Flats Environmental Technology Site Environmental Technology Site.

Four data sets were collected or compiled for this investigation: 1) samples collected from 240 plots of 1.01- or 4.05-hectare by compositing 25 evenly spaced samples from the upper 0.64 cm in each plot, 2) samples collected from the upper 5 cm of soil in 167 of the same 240 plots by compositing 10 samples from the center of each plot, 3) historical data compiled from samples collected between 1969 and 1973, considered to be the most indicative of the original release, and 4) the exhaustive data set that contains the above data sets as well as numerous unpublished data sets collected between 1974 and 1991. These latter samples varied in depth and method of sampling. Plutonium activity reported in the exhaustive data set ranged from 0.001 picoCurie per gram (pCi/g) to 11000 pCi/g with a mean of 39 pCi/g, a median of 0.18 pCi/g, a standard deviation of 499 pCi/g, and a coefficient of variation of 12.6.

The technique of nonparametric indicator kriging was used to model four conditional cumulative distribution functions (ccdf) of Plutonium 239+240 in soils around the Rocky Flats Environmental Technology Site Environmental Technology Site. Each of the ccdf was sued to generate an E-Type (mean of the conditional cdf) surface. The resulted surfaces were consistent with the hypothesis that the westerly winds were the dominant mechanism of plutonium dispersal. Other processes, such as downstream transport of sediment along local

southeast trending drainages may have additionally moved small amounts of plutonium.

The E-type estimate generated from the CDPHE soil sampling data is remarkably similar to that of the Rocky Flats Environmental Technology Site soil sampling data. There was no significant difference in Plutonium 239+240 activity in soils collected with the CDPHE sampler versus the Rocky Flats Environmental Technology Site sampler. These findings suggest that for the purpose of human and ecological risk assessment, the soil sampling technique has little effect on the outcome of the analysis.

The E-type surface configuration constructed in this study did not agree with the size and shape of the southeastern plume proposed by earlier studies. Results of these earlier studies were used to correlate rates of cancer incidence with activity of plutonium in supposedly contaminated soils (based on the proposed plume) in the greater Denver area. The E-type maps generated in the current study illustrate the inadequacy of past investigations which relied on small and poorly spaced data sets to formulate a human-health and ecological risk. Previous cancer incidence study can now be repeated with the robust E-type configurations to ascertain the impact of the Rocky Flats Environmental Technology Site Environmental Technology Site on residential areas downwind.

The ccdf's were also used to construct probability of exceedence maps of Plutonium 239+240 in soils. Two threshold values for the probability maps were selected: 1) the global fallout of plutonium and 2) the programmatic preliminary remediation goal for residential occupancy scenario (3.43 pCi/g). The probability of exceedence maps provides estimates of spatial uncertainty associated with each threshold. The E-type maps, in conjunction with the probability of exceedence maps, provide a robust framework for future clean-up options and land use decisions.

Surface Water IM/IRA

The OU 2 Surface Water Interim Measure/Interim Remedial Action (IM/IRA) includes temporary collection sumps, pumps, transfer pipelines, holding tanks, a trailer-mounted granular activated carbon (GAC) filtration system, and a trailer-mounted chemical precipitation/ microfiltration system designed to remove VOCs, metals, and radionuclide contamination from the water collected.

Treatment for VOCs using activated carbon began May 13, 1991. The radionuclide removal system was added to the system and began operation in April 1992. The Final Surface Water IM/IRA Treatability Study Report was submitted in March 1994. To date, the system has collected, treated, and discharged over 24.7 million gallons of surface water from the Walnut Creek drainage. EPA and CDPHE granted approval to discontinue the collection and treatment of two of the three sources. Two of the sources are at or below Applicable or Relevant and Appropriate (ARAR) standards. Alternative collection and treatment is being evaluated for the remaining source.

Subsurface IM/IRA

Under an agreement with EPA and CDPHE, a second IM/IRA was established in late 1991. This OU 2 IM/IRA will evaluate soil vapor extraction technology for removal of residual free-phase VOC contamination from three subsurface areas in the vadose zones of OU 2.

The Subsurface IM/IRA Plan was approved by EPA/CDPHE in September 1992. The Mobile Soil Vapor Extraction (MSVE) Unit was accepted by Rocky Flats Environmental Technology Site in August 1993. A scope of work was developed for reconfiguration of the MSVE pilot plant to allow for operation in the presence of high concentrations of Non-Aqueous Phase Liquids (NAPLs). Pilot testing was completed in May 1994. Over 940 pounds of VOCs have been removed to date. The system is currently being operated under post-pilot test conditions. Operations at Test Site 1 were stopped on December 16, 1994, because of the discovery of free phase liquids and high radionuclide activity in the burial trench adjacent to the MSVE unit. An accelerated action to address the free phase liquids and radionuclides will be initiated in 1995. Operations at Test Sites 2 and 3 are being planned.

Future Plans

Work is continuing on the Draft Phase II Resource Conservation and Recovery Act (RCRA) Facilities Investigation RFI/RI Report. The groundwater, surface water, and air models used for the RI/RFI Report have been developed. The Surface Water IM/IRA will continue to collect, treat, and discharge surface water. The Subsurface IM/IRA will proceed with development of test plans for selected OU 2 sites. Work on the Analysis of Remedial Action Alternatives will continue, and a CMS/FS Report will be prepared. These activities will lead to a Record of Decision (ROD) for OU 2. The extent of the Remedial Action will be determined by the results of the RFI/RI and CMS/FS and will be specified in the ROD. Table III lists the OU 2 IAG milestones planned for FY95.

TABLE II: OU 2 IAG Milestones Completed Through FY94

IAG Milestone Description	IAG Completion Original Date	Extension Date	Date Accomplished
Submit Draft Proposed IM/IRA Decision Document	June 19, 1990		June 19, 1990
Submit Proposed IM/IRA Decision Document	September 18, 1990		September 18, 1990
Submit Draft Responsiveness Summary	December 13, 1990		December 13, 1990
Submit Final Responsiveness Summary and Final IM/IRA Decision Document	January 11, 1991		January 11, 1991
Field Treatability Test System Installation Complete	March 8, 1991	May 10, 1991	May 10, 1991
Begin Field Treatability Testing	March 11, 1991	May 13, 1991	May 13, 1991
Complete IM/IRA Construction	September 30, 1991	April 24, 1992	April 24, 1992
Begin Field Treatability Testing (Entire System)	October 30, 1991	April 27, 1992	April 27, 1992
Submit Draft Treatability Test Report Phase I (GAC)	April 1, 1992		April 1, 1992
Submit Final Treatability Test Program Report Phase I (GAC)	June 2, 1992		June 2, 1992
Submit Draft Phase II RFI/RI Work Plan (Alluvial)	December 21, 1989		December 21, 1989
Submit Final Phase II RFI/RI Work Plan (Alluvial)	April 12, 1990		April 12, 1990
Submit Draft Phase II RFI/RI Work Plan (Bedrock)	February 5, 1991		February 5, 1991
Submit Final Phase II RFI/RI Work Plan (Bedrock)	July 2, 1991		July 2, 1991

IAG Milestone Description	IAG Completion Original Date	Extension Date	Date Accomplished
Submit Subsurface Site 1 Draft Test Plan			October 29, 1992
Submit Subsurface Site 1 Final Test Plan			January 12, 1993
Submit Subsurface Site 2 Draft Test Plan			June 24, 1993
Submit Preliminary Draft Phase II Surface Water Treatability Report			July 13, 1993
Submit Draft Phase II Surface Water Field Treatability Report			January 26, 1994
Submit Final Phase II Surface Water Field Treatability Report			March 23, 1994

TABLE III: OU 2 IAG Milestones Planned for FY95

IAG Milestone Description	IAG Completion Original Date	Extension Date
Submit Draft Phase II RFI/RI Report	March 12, 1993	May 30, 1995
Submit Final Phase II RFI/RI Report	August 9, 1993	September 21, 1995
Submit Draft CMS/FS Report	November 4, 1993	July 19, 1996
Submit Final CMS/FS Report	May 10, 1994	December 19, 1996
Submit Draft Proposed Plan (PP)	May 10, 1994	January 10, 1997
Submit Final Proposed Plan (PP)	August 9, 1994	March 25, 1997
Submit Draft Responsiveness Summary	December 13, 1994	August 25, 1997
Submit Final Responsiveness Summary	March 16, 1995	December 5, 1997
Submit Draft CAD/ROD	March 16, 1995	December 5, 1997
Submit Final CAD/ROD	June 15, 1995	March 3, 1998
Submit CD/RD Work Plan	June 15, 1995	Pending*

* Extension pending as a result of agency-imposed stop work order

OPERABLE UNIT 3, OFFSITE AREAS

Introduction

Operable Unit (OU) 3, the Offsite Areas, is comprised of that portion of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) activities that address the land adjacent to the United States DOE Rocky Flats Environmental Technology Site near Golden, Colorado, and the public water supply reservoirs near the Rocky Flats Environmental Technology Site.

Description

OU 3, Offsite Areas, consists of two surface areas: 350 acres of land directed to be remediated by the settlement of a 1985 lawsuit (McKay vs. U. S.) and three public water supply reservoirs. In addition, the Interagency Agreement (IAG) directs that assessment of contamination of these areas be undertaken according to the CERCLA. In the case of the 350 acres of surficial soils, DOE agreed to remediate these soils by deep-disc plowing, which began in 1985, followed by revegetation. The overall schedule for activities is determined by the year-to-year success of the revegetation efforts, which have been disappointing thus far, and by the requirements of the landowners. Plowing activities directed by the Settlement Agreement have been suspended until the CERCLA process is complete.

Major Contaminants

The major contaminants in the OU 3 investigation are low-level radionuclides (plutonium and americium) that decrease with distance from the eastern boundary of Rocky Flats Environmental Technology Site.

Description of Work Completed

IAG Directed Work

The Final Remedy Report for OU 3 was approved by the EPA and the CDPHE in 1991. The Remedy Report presented a summary of historical data and a preliminary Health Risk Assessment (HRA) for contaminated offsite soils. The Final Historical Information Summary and Preliminary Health Risk Assessment Report was approved by the EPA and CDPHE in 1991. This report is a companion document with the Remedy Report presenting information on offsite reservoirs. Table II contains a list of all IAG milestones completed through the first half of FY94. Field work, as directed by the regulatory agency-approved Remedial Investigation (RI) Work Plan, began in 1992. The surface soil sampling portion of the field work was completed in June 1993, and the remaining Wind Tunnel field work was completed in July 1993. Off-site landowners will be informed of the laboratory analysis results of soil samples obtained from their property.

In June 1993, the regulatory agencies directed DOE to stop work on OUs 1 through 7 for: (1) aggregation of RI data for the purpose of comparing background concentrations to select contaminants of concern (COCs) for the Human Health Risk Assessment (HHRA) and (2) aggregation of data for the purpose of conducting an exposure assessment. Work was stopped until April 15, 1994, when the parties to the IAG reached an agreement that provided guidance on the methodology for data aggregation for the HHRA and Resource Conservation and Recovery Act (RCRA) Facilities Investigation (RFI)/RI Report. The revised schedule to incorporate impacts of the stop work order has been approved by the regulatory agencies. The remaining tasks of the Risk Assessment including data evaluation, identification of exposure scenarios, selection of exposure parameters, and ecological effects assessment are proceeding as scheduled. Groundwater and air monitoring are planned to continue into 1995.

To answer land use questions concerning OU 3, DOE developed an interim document identifying an area of concern (AOC) within the OU 3 study area. This document identifies a small area of approximately 250 acres adjacent to Indiana Street opposite the Rocky Flats Environmental Technology Site east gate where soil contamination

exceeds levels that would be regarded as safe, based on judgements of acceptable risk. This document was approved by EPA in October 1993.

OU 3 comprises an area where activities such as land development, construction, and recreation may need restriction due to soil contamination.

Settlement Agreement Directed Work

Remediation and revegetation activities are currently required on approximately 200 of the 350 acres covered under the 1985 lawsuit agreement. Remedial activities are not required on the remaining 150 acres until requested by the owner. Of the total acreage, 100 acres are in active revegetation. In 1991, approximately 80 acres of disturbed soil from the 1985 remediation tilling were revegetated with a native seed mix and mulched to protect the soil surface. Semiannual reports to the landowner are written in January and July on Settlement Agreement activities. The site is monitored for weed control and revegetation success. DOE transmitted the Summer Biannual Report to Jefferson County Open Space, which reported on weed control actions on the Jefferson County Settlement Agreement. These actions included mowing of selected areas.

Future Plans

IAG Directed Activities

Work was begun in the Fall of 1993 on the Draft RFI/RI Report, which will contain an assessment of the nature and extent of contamination along with a Baseline Risk Assessment (BRA). The data evaluation, identification of exposure scenarios, selection of exposure parameters, and ecological affects assessment portions of the Risk Assessment are proceeding as scheduled. A Feasibility Study (FS) Work Plan will be initiated in FY95 and will be followed by the FS process with data analysis and preparation of the FS Report and Environmental Assessment (EA) to determine Final Actions.

Settlement Agreement Directed

The January semiannual report to Jefferson County documenting remedial action activities has been delivered. Results of negotiations with landowners will determine future actions on Settlement Agreement lands.

TABLE I: OU 3 Individual Hazardous Substance Sites

IHSS	Site Name
199	Contamination of the Land's Surface
200	Great Western Reservoir
201	Standley Reservoir
202	Mower Reservoir

TABLE II: OU 3 IAG Milestones Completed Through FY94

IAG Milestone Description	IAG Completion Original Date	Extension Date	Date Accomplished
Submit Draft Past Remedy Report	October 26, 1990		October 26, 1990
Submit Draft Historical Information and Preliminary Health Risk Assessment Report	November 9, 1990		November 9, 1990
Submit Final Past Remedy Report	April 2, 1991		April 2, 1991
Submit Final Historical Information and Preliminary Health Risk Assessment Report	April 16, 1991		April 16, 1991
Submit Draft Phase I RFI/RI Work Plan	May 16, 1991	July 10, 1991	July 10, 1991
Submit Final Phase I RFI/RI Work Plan	October 11, 1991	December 6, 1991	December 6, 1991

TABLE III: OU 3 IAG Milestones Planned for FY95

IAG Milestone Description	IAG Completion Original Date	Extension Date
Submit Draft Phase I RFI/RI Report	July 16, 1993	October 30, 1995
Submit Final Phase I RFI/RI Report	December 13, 1993	July 11, 1996

OPERABLE UNIT 4, SOLAR PONDS

Introduction

Operable Unit (OU) 4, Solar Ponds, is an element of the United States DOE Environmental Restoration (ER) Program at the Rocky Flats Environmental Technology Site located in Golden, Colorado.

Description

OU 4 includes five solar evaporation ponds: 207A, 207B series (North, Center, South), and 207C located in the northeast part of the Rocky Flats Environmental Technology Site protected area. Currently, Individual Hazardous Substance Sites (IHSS) 176 and 101 are included in OU 4's remediation planning. In the late 1950s, the ponds were used to store and evaporate low-level radioactive process water containing high concentrations of nitrates and treated acidic wastes.

In the 1960s and 1970s, the ponds were relined with various upgraded materials; however, leakage from the ponds into the soil and groundwater was suspected. In 1971 Interceptor trenches were installed to collect and recycle groundwater contaminated by the ponds and to prevent natural seepage and pond leakage from entering North Walnut Creek. In 1981, these trenches were upgraded to the current, larger interceptor trench system (ITS), which, until recently, had continuously recycled groundwater back into the solar evaporation ponds.

No additional process water has been pumped into the ponds since 1986. With the diversion of the ITS water to storage tanks in April 1993, groundwater was no longer returned to the ponds. The Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigation field work under the Rocky Flats Environmental Technology Site Interagency Agreement (IAG) began in FY93, and remediation will continue through construction of the final corrective/remedial action in FY00 (2000). The contaminants identified in OU 4 include nitrates, chromium, tritium, cadmium, Am 241, and Pu 239.

Description of Work Completed

The Solar Evaporation Ponds (SPP) Subproject encompasses four major tasks: dispositioning of non-certifiable pondcrete and pond sludge per the Interim Measure/Interim Remedial Action (IM/IRA) Decision Document (DD); water management/ treatment per the IM/IRA DD signed by DOE, Environmental Protection Agency (EPA), and CDPHE; the OU 4 assessments and remedial actions required by the IAG; and pad operations, storage, and disposal activities which are necessary to meet the site's RCRA interim status and permit requirements with regard to storage of pond wastes.

The four major tasks were planned to close the ponds and remediate the ponds area. In roughly chronological sequence, the project was scoped to remove water from the ponds, to provide a treatment facility to replace the ponds as treatment and storage units for ponds-related contaminated groundwater, to remove and store pond wastes, to assess the nature and extent of contamination at the ponds, to complete a RCRA closure of the impoundments, and to remediate the ponds area as needed.

During the first half of FY93, in-progress activities to implement the water management IM/IRA, which had missed three, decision document milestones in FY92, were replanned and rescheduled. New commitment dates were provided to DOE and the regulators, and the modular storage tanks to accept the ITS water were completed and placed in operation six days ahead of their commitment date. The tanks allowed EG&G to terminate the return of contaminated groundwater to the ponds. The water stored in these tanks is now being processed in Building 374 evaporation-treatment facilities.

Based on the analysis of uncertainties, DOE and EG&G concluded that the previous baseline approach (cementation of the C pond sludge in FY94, the B pond sludge in FY95, and the

currently stored/failing pondcrete and saltcrete after a disposal site opens) is less prudent than several other approaches.

The SPP program office formulated a revised program that has the following major features:

- Transfer the pond contents to tanks for interim storage.
- Pursue treatability studies on the existing stored sludge and pondcrete to be prepared to accelerate the schedule for processing to support the Phase I remediation.
- Close the ponds and remediate OU 4 (Phase I remediation).
- Continue the current actions to treat contaminated groundwater and store wastes safely.

Challenged by regulators in 1993 to accelerate the "start of construction" milestone, the Accelerated Sludge Removal Project (ASRP) was initiated. Seventy, 10,000 gallon high density polyethylene tanks were procured, certified, and made ready for use. Sludge was subsequently vacuumed from the ponds using a commercially available vacuum tanker trucks, and transferred to the sludge holding tanks. This process accelerated previous plans for sludge removal and processing, and allowed follow-on activities to commence months ahead of earlier predictions.

DOE has also revised its preferred remedy option which is presented in the IM/IRA DD which was released for public comment on February 10, 1995.

Work Planned for FY95

- Remove water and sludge from remaining Solar Pond and store in tanks for future processing complete.
- Treat ITS water as necessary.
- Complete IM/IRA DD.
- Complete drilling and sampling of Pond 207C in support of the Phase I RFI.
- Begin Phase II RFI/RI Field Activities.
- Continue Design for the OU 4 Phase I remedy, including sludge and pondcrete processing, and pond closure.
- Maintain safe and compliant storage for Solar Pond wastes.
- Maintain Building 910 in stand-by condition.
- Gain full compliance on the 750 and 904 Storage Pads by repacking and restacking inventoried pondcrete.

Current Status and Accomplishments

The assessment field work for the OU 4 remediation work is nearing completion, with work-arounds having been negotiated with the regulators to allow the assessment effort to resume meeting the IAG schedule after slipping two milestones in FY93. A compliance plan has been prepared to return the storage pads to full RCRA compliance with a milestone for completion on July 31, 1995, which is currently on schedule. These pads still store about half of the pondcrete produced in earlier years; the other half, about 9,000 blocks, was shipped to the Nevada Test Site (NTS) for disposal prior to 1990 when NTS ceased receipt of mixed wastes.

The Draft Phase I RFI/RI Report was due May 21, 1993. A letter requesting an extension to April 19, 1994, was submitted to the regulatory agencies on May 5, 1993. The regulatory agencies granted a 79-working day extension but DOE was not satisfied and initiated the "dispute resolution" process in accordance with the IAG. Subsequently, the regulatory agencies and DOE reached an agreement to resolve the OU 4 Solar Ponds dispute concerning the Draft and Final Phase I RFI/RI Report. The agreement included the following provisions: (1) the requirements for a separate Draft and Final Phase I RFI/RI Report for OU 4 were eliminated in favor of consolidating the report and the IM/IRA DD, thus deleting the milestone dates, (2) a new IAG milestone is established for "all Solar Ponds emptied of water and sludge", with an IAG milestone date of January 20, 1995; and (3) IAG milestones were revised. Generally, the administrative and design processes were consolidated.

DOE and EG&G agreed on a vacuum removal system as the method for removing remaining water and pond sludge in Ponds 207B South and 207C. Vacuum pumping operations utilizing commercially available vacuum tanker trucks began February 7, 1994 in Pond 207B South. The sludge is collected and then transported from the

ponds to high density polyethylene storage tanks located on the 750 Pad. Despite initial slow progress due to harsh weather and equipment difficulties, Pond 207B South was emptied on May 9, 1994. A hard salt layer was discovered under the sludge in Pond 207C and it was removed using front-end loaders. The sludge/salt mixture was stored in metal containers and is now being transferred to the sludge storage tanks. Pond 207C was completed on January 15, 1995, thereby meeting the IAG milestone, "All Ponds Emptied of Water and Sludge."

The regulatory agencies, DOE, and subcontractor representatives are developing the specific criteria which must be met in order to designate the OU 4 remediation site as a Corrective Action Management Unit (CAMU). Designation of the site as a CAMU and application of the regulatory flexibility provided under the CAMU/Temporary Unit (TU) rule are key elements for economic and timely remediation of the site. Since this will likely be the first application of the state's newly enacted version of the CAMU/TU regulations, close cooperation between all parties is essential to gain confidence in this new law and its successful application to OU 4.

Preparation of the IM/IRA Environmental Assessment (EA) DD was completed and submitted to the regulators on February 1, 1995, nine days earlier than the IAG deliverable.

Sections of the proposed draft document commenced delivery to DOE and the regulatory agencies on February 14, 1994, and the draft was delivered to the regulatory agencies on May 27, 1994. Dispute resolution was initiated under provisions in the IAG in July 1994 to resolve differences concerning the engineered barrier design and sludge placement. The dispute ended in the same month with no formal agreement being made. Instead, the State of Colorado has allowed DOE and EG&G to continue planning that requires treated pondsludge and pondcrete to be placed under the engineered barrier. The State has opted to reserve comment until after the public comment period of the proposed IM/IRA Decision Document. A new milestone schedule which was approved by regulators on November 23,1994, is reflected in Table II. Public comment commenced on the Final Phase I IM/IRA DD on February 10, 1995.

TABLE I: OU 4 IAG Milestones Completed Through FY94

IAG Milestone Description	IAG Completion Original Date	Extension Date	Date Accomplished
Submit Draft Phase I RFI/RI Work Plan	June 8, 1990		June 8, 1990
Submit Final Phase I RFI/RI Work Plan	November 26, 1991		November 26, 1991
Submit Draft Phase I Proposed IM/IRA Decision Document	April 14, 1994	May 27, 1994	May 27, 1994
Submit Draft Phase II RFI/RI Work Plan	April 22, 1994	May 27, 1994	May 27, 1994
Submit Final Phase II RFI/RI Work Plan	September 19, 1994	September 7, 1994	September 1, 1994

TABLE II: OU 4 IAG Milestones Planned for FY95

IAG Milestone Description	IAG Completion Original Date	Extension Date	Date Accomplished
Submit Draft Phase I RFI/RI Report	May 21, 1993	Deleted	
Submit Final Phase I RFI/RI Report	October 18, 1993	Deleted	
Submit Phase I Proposed IM/IRA Decision Document	September 12, 1994	February 10, 1995	February 1, 1995
Submit IM Design Work Plan	May 24, 1995	Deleted	
All Solar Ponds Emptied of Water and Sludge	New	January 20, 1995	January 15, 1995
Submit IM/IRA Responsiveness Summary	January 25, 1995	June 9, 1995	
Submit Final IM/IRA Decision Document and Responsiveness Summary	April 24, 1995	August 29, 1995	

OPERABLE UNIT 5, WOMAN CREEK PRIORITY DRAINAGE

Introduction

Operable Unit (OU) 5, Woman Creek Priority Drainage, is an element of the United States DOE Environmental Restoration Program at the Rocky Flats Environmental Technology Site in Golden, Colorado. Woman Creek, flowing from west to east across the southern third of Rocky Flats Environmental Technology Site, collects and drains surface water, including runoff from the extreme southern part of the Rocky Flats Environmental Technology Site Industrial Area, and eventually flows into Mower Reservoir or the diversion ditch around Great Western Reservoir.

Description

OU 5 encompasses assessment and remediation in the Woman Creek drainage of its 11 Individual Hazardous Substance Sites (IHSSs). Two additional surface disturbances have been identified, one located south of the ash pits and a second, west of IHSS 209. These last two sites have been included in the OU 5 Work Plan. Possible contamination in this OU was caused by early DOE Rocky Flats Environmental Technology Site Field Office (RFFO) landfill operations, storm water runoff into holding ponds, and ash pit operations.

Major Contaminants

Identified major contaminants include solvents, paints, paint thinner, oil, pesticides, cleaners, beryllium, uranium, depleted uranium, plutonium, graphite, ash from plant waste, metals, nitrates, and nonradioactive, hazardous chemical waste.

Description of Work Completed

OU Assessment

The Phase I Remedial Investigation (RI) statement of work, proposals, and contract negotiations were completed in 1990. The Draft Phase I RI Work Plan and the Final RI Work Plan have been submitted, and conditional approval from the agencies was received in February 1992, with field work beginning in August 1992. Table II lists the Interagency Agreement (IAG) milestones completed through the first half of FY94. Phase I Resource Conservation Recovery Act (RCRA) Facility Investigation (RFI)/RI field work except for routine water well and well point monitoring was completed on August 31, 1993.

On April 15, 1994, the Human Health Risk Assessment stop work order, which had been in effect since June 1993, was lifted by the regulatory agencies. Guidance was provided on the data aggregation methods for the Risk Assessment and the RFI/RI Report.

On December 15, 1994, a request to revise the IAG milestone dates for submittal of the Draft and Final Remedial Investigation Reports was sent to the EPA and CDPHE. The requested dates for the submittal of the Draft Remedial Investigation Report is November 1, 1995; the Final Remedial Investigation Report, on April 2, 1996. The remaining tasks of the Risk Assessment, including data evaluation, identification of exposure scenarios, selection of exposure parameters, and ecological effects assessment are proceeding as scheduled. Groundwater monitoring is planned to continue through September 1995.

Technical Memorandum (TM) #15, *Addendum to the Field Sampling Plan*, was approved by the regulatory agencies and field work began in August 1994, and completion of the field work was scheduled for February 1995. TM #15 implements a program of additional sampling and analysis to the Work Plan for the Phase I RFI/RI. The original landfill and the filter backwash pond require additional groundwater sampling, air monitoring, and a geotechnical investigation of the long-term stability of the original landfill if the decision is made to leave the waste in place. The ashpits and the concrete wash pad require further investigation of the anomalies identified by the first Time Domain Electromagnetic Survey. In addition, further groundwater and air monitoring investigations will be conducted. Finally, IHSS 209 and the other surface disturbances will undergo radiological surveys and soil sampling.

Feasibility Study

Work has begun on the Feasibility Study. TM #1, *Development of Corrective/Remedial Action Objectives* and TM #2, *Initial Screening of Remedial Alternatives* are in progress. A focused Feasibility Study that was underway at IHSS 115, the Original Landfill has given away to a full feasibility study based on preliminary geotechnical data from the going field investigation. The presumptive remedy is a landfill cap with a leachate collection system if necessary.

Future Plans

Work will continue on the Baseline Risk Assessment which will be incorporated into the RFI/RI Report and Feasibility Study (FS) for OU 5 and will be followed by the Record of Decision (ROD). The final remedial action (RA) for the IHSSs may provide for the landfill to be excavated, treated, and disposed at onsite or offsite facilities. Soils potentially contaminated with radionuclides may be excavated, treated, and relocated to new soil solidification facilities for crating and then shipped to a final disposal site. Organics in water will be removed by granular activated carbon (GAC) units or ultraviolet (UV)/peroxide treatment. The extent of the RA will be determined by results of the RI and FS. Table III lists the OU 5 IAG milestones planned for FY95.

TABLE I: OU 5 Individual Hazardous Substance Sites

IHSS	Site Name	IHSS	Site Name
115	Original Landfill	133.6	Concrete Wash Pad
133.1	Ash Pit 1	142.10	Retention Pond: C-1
133.2	Ash Pit 2	142.11	Retention Pond: C-2
133.3	Ash Pit 3	196	Water Treatment Plant Backwash Pond
133.4	Ash Pit 4		
133.5	Incinerator	209	Surface Disturbance SE of Bldg 881

TABLE II: OU 5 IAG Milestones Completed Through FY94

IAG Milestone Description	IAG Completion Original Date	Extension Date	Date Accomplished
Submit Draft Phase I RFI/RI Work Plan	April 5, 1991	N/A	April 5, 1991
Submit Final Phase I RFI/RI Work Plan	August 30, 1991	N/A	August 30, 1991

TABLE III: OU 5 IAG Milestones Planned for FY95

IAG Milestone Description	IAG Completion Original Date	Current Extension Date	Extension Date Reque
Submit Draft Phase I RFI/RI Report	November 30, 1993	July 21, 1995	November 1, 1995
Submit Final Phase I RFI/RI Report	May 3, 1994	January 17, 1996	April 2, 1996

OPERABLE UNIT 6, WALNUT CREEK

Introduction

Operable Unit (OU) 6, Walnut Creek, is an element of the United States DOE Environmental Restoration (ER) Program at the Rocky Flats Environmental Technology in Golden, Colorado.

Description

OU 6 encompasses assessment and remediation of 19 Individual Hazardous Substance Sites (IHSSs) in the Walnut Creek drainage which drains the surface water from the north half of Rocky Flats Environmental Technology Site, including the runoff from a large portion of the Industrial Area. The OU 6 IHSSs are shown in Table I. OU 6 activities also include sixteen groundwater monitoring wells which have been installed throughout OU 6 to monitor the alluvial aquifer.

Major Contaminants

Based on the Draft Final Chemicals of Concern Technical Memorandum (TM), the suspected contaminants in the soils, sediments, and water for OU 6 include americium, plutonium, uranium, polychlorinated biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAHs), and volatile organic compounds (VOCs).

Description of Work Completed

OU Assessment

DOE accepted a ten-month extension agreed upon by the regulatory agencies for the Draft and Final Phase I Remedial Investigation (RI) Reports. The field work portion of the Phase I RI is complete, and data analysis has begun.

On April 15, 1994, the Human Health Risk Assessment stop work order, which had been in effect since June 1993, was lifted by the regulatory agencies. Guidance was provided on the data aggregation methods for the Risk Assessment and the RFI/RI Report.

On December 15, 1994, a request to revise the agency-approved IAG milestone dates for submittal of the Draft and Final RI Reports was sent to the EPA and CDPHE. The requested dates for the submittal of the Draft Phase I RI Report is October 2, 1995; and the Final Phase I RI Report, February 21, 1996.

Preliminary analytical results have been reported from the laboratory PCB tissue analysis showing slightly elevated levels of PCBs in the tissues of fathead minnows from B-4 Pond. Sampling results from the bass in A-3 Pond and from the fathead minnows in A-4 and B-5 Ponds were considerably less. The preliminary sediment PCB data have not revealed any significant PCB contamination.

Table II lists the Interagency Agreement (IAG) milestones completed through FY94. The remaining activities necessary to complete the RFI/RI Report include surface water, air, and groundwater modeling; nature and extent delineation; and risk assessment. Also, several chapters must be generated for inclusion in the report. Under the Feasibility Study, work will begin on TM #1, *Development of Corrective/ Remedial Action Objectives* in October 1994. This TM will present preliminary remediation goals, general response actions, and remedial action objectives.

Future Plans

The RI field activities, which will lead to the RI Report and Feasibility Study (FS) activities for OU 6, will continue and will be followed by the Record of Decision (ROD). It is anticipated that the Final Remedial Action (RA) will provide for "No Further Action" for some of the IHSSs and, institutional controls or cleaning, removing, or stabilizing contamination in the pond sediments to prevent further spread to the environment.

The extent of the RA will be determined by results of the RI and FS. Table III lists the OU 6 IAG milestones planned for FY95.

TABLE I: OU 6 Individual Hazardous Substance Sites

IHSS	Site Name	IHSS	Site Name
141	Sludge Dispersal	143	Old Outfall
142.1	Retention Ponds: A-1 Pond	156.2	Soil Dump Area
142.2	Retention Ponds: A-2 Pond	165	Triangle Area
142.3	Retention Ponds: A-3 Pond	166.1	Trench A
142.4	Retention Ponds: A-4 Pond	166.2	Trench B
142.5	Retention Ponds: B-1 Pond	166.3	Trench C
142.6	Retention Ponds: B-2 Pond	167.1	North Area - Spray Field
142.7	Retention Ponds: B-3 Pond	216.1	East Area - Spray Field
142.8	Retention Ponds: B-4 Pond		
142.9	Retention Ponds: B-5 Pond		
142.12	Newly Identified A-5 Pond		

* IHSSs 167.2 and 167.3 have been administratively placed in OU 7.

TABLE II: OU 6 IAG Milestones Completed Through FY94

IAG Milestone Description	IAG Completion Original Date	Extension Date	Date Accomplished
Submit Draft Phase I RFI/RI Work Plan	April 19, 1991	N/A	April 19, 1991
Submit Final Phase I RFI/RI Work Plan	September 16, 1991	N/A	September 16, 1991

TABLE III: OU 6 IAG Milestones Planned for FY95

IAG Milestone Description	IAG Completion Original Date	Current Extension Date	Extension Date Request
Submit Draft Phase I RFI/RI Report	August 4, 1993	June 21, 1995	October 2, 1995
Submit Final Phase I RFI/RI Report	January 7, 1994	December 21, 1995	February 21, 1996

OPERABLE UNIT 7, PRESENT LANDFILL

Introduction

Operable Unit (OU) 7, Present Landfill, is an element of the United States DOE Environmental Restoration (ER) Program at the Rocky Flats Environmental Technology in Golden, Colorado.

Description

The Present Landfill, OU 7, is located north of the plant complex on the western edge of an unnamed tributary of North Walnut Creek and is comprised of four Individual Hazardous Substance Sites (IHSSs). IHSS 114, Present Landfill, includes landfill waste and leachate at the Present Landfill, soils beneath the landfill potentially contaminated with leachate, and sediments and water in the East Landfill Pond. IHSS 203, Inactive Waste Storage Area, contains potentially contaminated soils at the Inactive Hazardous Waste Storage Area. IHSSs 167.2 and 167.3 are two spray evaporation fields located to the north and south of the landfill pond. A section of the Present Landfill located in the southwest corner was used between 1986 and 1987 as a temporary storage area for hazardous waste. The Present Landfill began operation in August 1968 and was originally constructed to provide for disposal of Rocky Flats Environmental Technology Site' nonradioactive and nonhazardous wastes. In September 1973, tritium was detected in leachate from the landfill. In response, a groundwater diversion and leachate collection system was constructed. During the mid-1980s, extensive investigations were conducted on the waste streams (types) placed into the landfill, and consequently, hazardous wastes/hazardous constituents were identified. Although currently operating as a nonhazardous sanitary landfill, the facility is considered an inactive hazardous waste disposal unit undergoing remediation and closure.

Major Contaminants

Major contaminants identified in OU 7 from historical records and preliminary assessments include tritium, volatile organic compounds (VOCs), and metals at various concentrations.

Description of Work Completed/In Progress

OU Assessment

The required preparations and reviews were successfully completed for submittal of the Draft Phase I RCRA Facility Investigation (RFI) Work Plan in 1990. The EPA and the CDPHE review of the Work Plan was completed in 1991. The Final Phase I RFI Work Plan was approved in 1991. Implementation of the Work Plan began in October 1993. Site characterization activities and subsequent development of a Phase I RFI/ Remedial Investigation (RI) Report was completed in 1994. The Phase II RFI Work Plan was approved in 1994. Implementation of the Phase II Work Plan began in the fall of 1994.

On April 15, 1994, the Human Health stop work order, which had been in effect since June 1993, was lifted by the regulatory agencies. Guidance was provided on the data aggregation methods for the Risk Assessment and the RFI/RI Report.

The regulatory agencies have formally agreed to the rescoping and accelerating the schedule for OU 7. The strategy is to combine the Phase I RFI/RI Report and Phase II Work Plan deliverables. The final Data Quality Objective documents were approved by the regulatory agencies in April 1994.

As a result of the Senior Executive Committee Dispute Resolution, four new milestones were added to the OU 7 work scope. These milestones, which concern the Landfill Leachate Collection project, will be completed as a Proposed Action Memorandum as directed by the regulatory agencies.

Future Plans

The RFI Phase I and II field activities will lead to the Interim Measure/Interim Remedial Action/ Decision Document (IM/IRA/DD). The final remedial action will include a landfill cap; leachate, groundwater, and gas collection and treatment; and surface water diversion. Groundwater and leachate contaminated with radionuclides and metal will be treated using an ion exchange process to a precipitation flocculation/filtration process. Water contaminated with organics may be treated with granular activated carbon (GAC) units or an ultraviolet (UV)/peroxide process. The landfill or landfill pond sediments will be covered with a standard RCRA cap. Table III lists the OU 7 Interagency Agreement (IAG) milestones planned for FY95.

TABLE I: OU 7 IAG Milestones Completed Through FY94

IAG Milestone Description	IAG Completion Original Date	Extension Date	Date Accomplished
Submit Draft Phase I RFI/RI Work Plan	June 8, 1990		June 8, 1990
Submit Final Phase I RFI/RI Work Plan	August 28, 1991		August 28, 1991
Submit Draft Phase I RFI/RI Report*	October 12, 1993		May 24, 1994
Submit Final Phase I RFI/RI Report*	March 16, 1994		September 8, 1994
Submit Draft Phase II RFI/RI Work Plan*	September 13, 1994		May 24, 1994
Submit Final Phase II RFI/RI Work Plan	February 15, 1995		September 8, 1994

* The submittal of the Field Sampling Plan fulfilled the original IAG milestone.

TABLE II: OU 7 IAG Milestones Planned for FY95

IAG Milestone Description	IAG Completion Original Date	Extension Date
Submit Draft Phase I Proposed IM/IRA Decision Document	November 1, 1994	February 14, 1997
Submit Final Phase I Proposed IM/IRA Decision Document	April 6, 1995	October 16, 1997

INDUSTRIAL AREA OPERABLE UNITS 8, 9, 10, 12, 13, & 14

Description

The Rocky Flats Environmental Technology Site Environmental Restoration (ER) Programs are part of the United States DOE national ER Program which was established to identify and clean up inactive waste sites at DOE facilities in compliance with applicable federal and state environmental laws and regulations and compliance agreements. EPA, CDPHE, and DOE signed an Interagency Agreement (IAG) that establishes the regulatory and technical requirements for Rocky Flats Environmental Technology Site ER Program. The IAG organized 177 Individual Hazardous Substance Sites (IHSSs) at Rocky Flats Environmental Technology Site into 16 operable units (OUs). The description, work completed to date, and future plans of six of these OUs, which are located in Rocky Flats Environmental Technology Site' Industrial Area (IA) where the environmental and logistical conditions are similar, are presented in this fact sheet.

The six OUs included in the IA are:

OU 8 - 700 Area consists of 24 IHSSs primarily inside and around production areas at Rocky Flats Environmental Technology Site. Potential contamination exists from a wide variety of sources from above-ground and underground tanks, equipment washing areas, and releases from inside buildings that may have migrated outside the building. Contaminants from these sources include nonradioactive inorganic and organic compounds (e.g., acids, bases, solvents, and petroleum products). Also, potential contamination exists from low-level, radioactive mixed wastes.

OU 9 - Original Process Waste Lines (OPWL) consists of a series of tanks and associated pipelines that once carried the majority of Rocky Flats Environmental Technology Site' process wastes to holding areas for treatment during production. The OPWL system consists of 57 designated pipe sections extending between 73 tanks and 24 buildings connected by 35,000 feet of buried pipeline. The system was replaced over the 1975 to 1983 period. The OPWL system was known to carry or have stored various liquid process wastes containing low-level, radioactive materials, nitrates, caustics, and acids.

OU 10 - Other Outside Closures consists of 16 IHSSs throughout the IA at Rocky Flats Environmental Technology Site. The main type of wastes identified at these IHSSs range from storage yards for pondcrete/saltcrete from the OU 4 Solar Ponds, drum storage yard, and a property utilization and disposal yard for salvage equipment. Various contaminants such as low-level radioactive mixed wastes, inorganic, and organic compounds may have impacted the environment.

OU 12 - 400/800 Area consists of 10 IHSSs. These areas are loading dock areas, cooling towers, fiberglass areas, and leaks from process waste areas. The types of contamination include solvents spills, low-level, radioactive process wastes, and acid spills.

OU 13 - 100 Area consists of 16 IHSSs including former chemical storage sites, radioactive waste storage, and scrap metal sites. Various contamination exists from several areas such as oil burning pits, lithium metal destruction areas, and solvent burning sites where wastes were destroyed. Other constituents include low-level radioactive waste spills, chemicals, and petroleum spills.

OU 14 - Radioactive Sites consists of eight IHSSs where radioactive spills have occurred. The contamination at these areas are low-level, radioactive wastes and possible low-level, mixed wastes.

Work Completed

Consolidation of IA OUs is justified because the scope of work and logistical approach for all six OUs are very similar. This integration will provide a more efficient use of resources. The focus of the individual OU investigations is similar with respect to implementation of initial field activities. The integrated Field Sampling Plan (FSP) for the IA OUs, which includes radiation surveys, surface

soil sampling, soil gas analysis, data compilation, etc., is in final review. Additionally, many of the IHSSs associated with each OU are located adjacent to one another, and in many cases, overlap with IHSSs from other OUs within the IA.

This consolidation of field work for the IA OUs has reduced costs by identifying and eliminating redundant sampling efforts. Additionally, logistics and administrative support between IA OUs has been reduced because a single subcontractor will be utilized for field work implementation. Schedules have been developed that combine the FSPs from each OU, thereby providing a common oversight of the tasks, effort, and resource allocations for initial field work.

RFFO issued a formal Stop Work Order during the first week of March 1995. The Stop Work Order does not apply to current non-intrusive field work activites.

The nonintrusive fieldwork has been completed on all IA OUs, as described in each OU FSP contained in the Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI)/Remedial Investigation (RI) Work Plans.

CDPHE and EPA signed the Resolution Statement for the OU 9 tank dispute. This ends the dispute resolution process pertaining to the investigation of active tanks in OU 9 and approves the original Technical Memorandum #1, Field Sampling Plan - Original Process Waste Lines - Volume I, Part A, Outside Tanks, that addressed the tanks that were not in dispute. The modification to the Industrial Area Health and Safety Plan to address Tanks T-8, T-9, and T-24/32 was completed and issued. Surface soil sampling started on February 14, 1995, at tanks T-1, T-2/3, T-24/32, T-29, and T-40.

The final Industrial Area Surface Water and Sediment Field Sampling Plan Technical Memorandum was delivered to the regulatory agencies January 5, 1995, ahead of the milestone date. It was approved in January 1995, and sampling began February 1, 1995. This plan was exempted from the Stop Work Order, and the first stage of sampling was completed during the week of March 20, 1995.

Future Plans

The Proposed Plan for Reconfiguration of the Industrial Area Operable Units was submitted to the regulatory agencies November 4, 1994. The plan proposes three OUs, with one reporting Activity Data Sheet (ADS) number effective in FY96. As the results from the non-intrusive technical memoranda are completed, they will be used as a baseline to segregate the IA IHSSs into three separate OUs: 1) No further action, 2) Potential Early Actions and RFI/RI process, and 3) Deferred until Decontamination and Decommissioning (D&D). To date no written comments have been received on the proposed plan. Presently, the field effort for IA OUs will continue with additional planning stages to support funding requests for future years.

The development of the ADS for the Five Year Plan for FY97-2001 continued through March 1995. The six individual Operable Unit ADSs are being combined as one consolidated ADS for the Industrial Area beginning in FY96. Funding for the Consolidated Industrial Area Operable Units has been cut drastically for FY96. This will postpone work to FY97, with the exception of the IM/IRA and three Accelerated Action projects.

Future plans include obtaining regulatory approval of the finalized Plan for Reconfiguration of the Industrial Area Operable Units, finalizing and obtaining approval for a process for determining the remediation category of IHSSs, initiating intrusive field activities (e.g., soil borings and subsurface sampling), completing removal of materials stored on IHSSs, completing various OU-specific technical memoranda, and working to identify and accelerate source removal actions for the IA OUs.

OPERABLE UNIT 11, WEST SPRAY FIELD

Introduction

Operable Unit (OU) 11, West Spray Field, is an element of United States DOE Environmental Restoration (ER) Program at the Rocky Flats Environmental Technology Site in Golden, Colorado.

Description

OU 11, which consists of one Individual Hazardous Substance Site (IHSS), IHSS 168, the West Spray Field is located within the Rocky Flats Environmental Technology Site buffer zone immediately west of the plant security area. The West Spray Field was in operation from April 1982 to October 1985. During operation, excess liquids from solar evaporation ponds 207B North and Center (contaminated groundwater in the vicinity of the ponds and treated sanitary sewage effluent) were pumped periodically to the West Spray Field for spray application. The spray field boundary covers an area of approximately 105.1 acres, 38.3 of which received direct application of potentially hazardous waste. The Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI)/Remedial Investigation (RI) process entailed field studies to investigate the presence of hazardous constituents in soil and groundwater and will include an assessment of risk from any contaminants identified.

Major Contaminants

Potential contaminants identified are metals, nitrates, inorganics, and radionuclides (U, Pu, Am, and tritium).

Description of Work Completed

OU Assessment

Both the Draft and Final Phase I RFI/Remedial Investigation (RI) Work Plans have been submitted to the regulatory agencies. Technical Memorandum (TM) #1, *Revised Field Sampling Plan (FSP) and Data Quality Objectives*, has been implemented. Monitoring well installation and surface soil sampling have been completed. Interagency Agreement (IAG) signatories have negotiated a streamlined final action process. This includes integrating Phases I and II field activities, and integrating Interim Measures (IM)/Interim Remedial Action (IRA) with field corrective actions. This integration has resulted in an accelerated schedule including the deletion of several IAG milestones, as well as significant cost savings.

Future Plans

The RFI/RI field activity information is being incorporated into the RFI Report, which will assess risk from OU 11. Future plans include: (1) Risk Assessment based on data from FSP and (2) decisions on whether to treat waste or justify no further action. Existing conditions and data indicate a justification of no further action for a Corrective Action Decision (CAD)/Record of Decision (ROD). It is anticipated that the Final Remedial Action (RA), if necessary, will treat groundwater contaminated with radionuclides and metals using an ion exchange process or a precipitation/ the flocculation/ the filtration process. Soils contaminated with radionuclides may be excavated and transported to a soil treatment facility prior to shipment to a low-level disposal site. Soils contaminated with organics and metals may be excavated and relocated to new RCRA-compliant storage cells on the site. The extent of the RA will be determined by results of the RFI/RI and CMS/FS. Table I lists the OU 11 IAG milestones completed through FY94. Table II lists the OU 11 IAG milestone planned for FY95.

TABLE I: OU 11 IAG Milestones Completed Through FY94

IAG Milestone Description	IAG Completion Original Date	Extension Date	Date Accomplished
Submit Draft Phase I RFI/RI Work Plan	June 8, 1990		June 8, 1990
Submit Final Phase I RFI/RI Work Plan	January 2, 1992		January 2, 1992

TABLE II: OU 11 IAG Milestones Planned for FY95

IAG Milestone Description	IAG Completion Original Date	Extension Date
Submit Draft Phase I RFI/RI Report	September 20, 1994	Replaced*
Submit Final Phase I RFI/RI Report	February 22, 1995	Replaced*
Submit Draft Phase II RFI/RI Work Plan	August 21, 1995	Replaced*
Submit Final Phase II RFI/RI Work Plan	January 24, 1996	Replaced*
Submit Draft Phase II RFI/RI Report	August 13, 1997	Replaced*
Submit Final Phase II RFI/RI Report	January 16, 1998	Replaced*

*Replaced by combining Phase I and Phase II for investigation and report writing.

Submit Draft RFI/RI Report	N/A	July 20, 1995
Submit Final RFI/RI Report*	N/A	September 19, 1995

OPERABLE UNIT 15, INSIDE BUILDING CLOSURES

Introduction

Operable Unit (OU) 15, Inside Building Closures, is an element of the United States DOE Environmental Restoration (ER) Program at the Rocky Flats Environmental Technology Site in Golden, Colorado.

Description

OU 15 is comprised of six Individual Hazardous Substance Sites (IHSSs), as shown in Table I. The six IHSSs currently have interim status under the Resource Conservation and Recovery Act (RCRA). The work plan included characterization of potential contamination associated with the OU 15 IHSSs both inside and outside buildings and, if applicable, decontamination of the indoor facilities and remediation of contamination outside buildings. A sampling and characterization was conducted inside the buildings, and resulted in a determination that no hazardous or radiological materials had migrated outside the buildings.

The OU 15 scope has been significantly reduced. Closure plans for the IHSSs were submitted to the CDPHE during 1988 and 1989. However, closure remediation plans are no longer necessary for the OU 15 IHSSs. Therefore, implementation of the closure plans will not be necessary. The six IHSSs will undergo closure via the Proposed Plan (PP) and CAD/ROD processes described within the Rocky Flats Environmental Technology Site Interagency Agreement (IAG).

Potential Contaminants

Identified potential contaminants included chlorinated solvents, beryllium, and uranium, as indicated by historical reports. A major purpose of the Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI)/Remedial Investigation (RI) was to determine if contamination is present since documentation of a release is available for one OU 15 IHSS only.

Description of Work Completed

OU Assessment

Both the Draft and Final Phase I RFI/RI Work Plans were approved by the EPA and CDPHE. In April 1992, IHSS 215, Unit 55.13 - Tank T-40 was deleted from OU 15 and added to OU 9 as part of an IHSS realignment of the IAG. This change was recommended by DOE in the OU 9 Phase I RFI/RI Work Plan approved by CDPHE and EPA. Similarly, IHSS 212, RCRA Unit 63, was removed from the IAG schedule for OU 15 because it is currently active as a Drum Storage Area and has been included in the Rocky Flats Environmental Technology Site RCRA Part B Transuranic (TRU) Mixed Waste permit application.

Stages I and II of the Phase I RFI/RI field sampling work for OU 15 have been completed. The Phase I RFI/RI Technical Memorandum (TM) #1, *Field Sampling Plan*, was approved by the EPA and CDPHE. The Draft Phase I RFI/ RI Report has been reviewed by the EPA and CDPHE. The Final Phase I RFI/RI report was approved by the EPA and CDPHE on January 25, 1995. This submittal was made without the resolution of the EPA's comments on the Draft RFI/RI Report which were received December 8, 1994, too late for incorporation. The EPA's comments were formally responded to by separate written correspondence as suggested by the CDPHE and approved as part of the Final Phase I RFI/RI Report. The Draft Proposed Plan was submitted to the EPA and CDPHE on March 24, 1995.

Future Plans

Based upon the TM #1 data and supported by the Final Phase I RFI/RI Report sampling analysis results, OU 15 will be closed with a "No Action" Record of Decision (ROD) provided that the regulatory agencies concur. A Proposed Plan to this effect has been prepared based on the "No Action" ROD scenario. This Proposed Plan was to be submitted to the regulatory agencies for consideration on March 24, 1995. This approach,

if approved by the EPA and CDPHE, will be accomplished through the CAD/ROD process and current intentions are to complete all OU 15 closure efforts, prior to January 1996, in accordance with the EG&G project concept.

TABLE I: OU 15 Individual Hazardous Substance Sites

IHSS	Site Name
178	Building 881 Drum Storage Area
179	Building 865 Drum Storage Area
180	Building 883 Drum Storage Area
204	Unit 45, Original Uranium Chip Roaster
211	Unit 26, Building 881 Drum Storage
217	Unit 32, Building 881 Cyanide Bench Scale Treatment

TABLE II: OU 15 IAG Milestones Completed Through FY94

IAG Milestone Description	IAG Completion Original Date	Extension Date	Date Accomplished
Submit Draft Phase I RFI/RI Work Plan	June 1, 1992		June 1, 1992
Submit Final Phase I RFI/RI Work Plan	October 26, 1992		October 26, 1992
Submit Draft Phase I RFI/RI Report	August 1, 1994		July 25, 1994
Submit Final Phase I RFI/RI Report	January 4, 1995		December 19, 1994

OPERABLE UNIT 16, LOW PRIORITY SITES

Introduction

Operable Unit (OU) 16, Low Priority Sites, is an element of the United States DOE Environmental Restoration (ER) Program at the Rocky Flats Environmental Technology Site in Golden, Colorado.

Description

OU 16, Low Priority Sites, originally consisted of seven Individual Hazardous Substance Sites (IHSSs) as shown in Table I. There are now only five IHSSs associated with OU 16. Six of the original sites are inside the Rocky Flats Environmental Technology Site protected area (PA), and one is in the Rocky Flats Environmental Technology Site buffer zone north of the PA. The seven IHSSs were grouped together in the IAG because of the likelihood that previous response actions or natural environmental processes at these low-priority sites have eliminated the need for further action. In accordance with the EPA guidance (1988a), a "No Action" decision is appropriate at sites where a previous removal action or natural environmental processes mitigate risks to human health and the environment. The risks associated with each of the IHSSs in OU 16 and the need for further action are assessed in the document using a conceptual model to evaluate the exposure pathways by which human and biotic receptors may be exposed to contaminants.

Potential Contaminants

Potential contaminants in OU 16 IHSSs include solvents, antifreeze, steam condensate, nickel carbonyl, backwash pond material from water treatment, and scrap metal.

Description of Work Completed

OU Assessment

Potential risks to human health and the environment associated with historical releases and spills at IHSSs 185, 192, 193, 194, and 195 have been mitigated by past response actions and/or natural attenuation processes that eliminate the source or exposure pathways. Therefore, further action is not justified for these five IHSSs. Further action for IHSSs 196 and 197 will be accomplished through investigation of proximate IHSSs in other OUs. IHSS 196 will be investigated as part of IHSS 115 (OU 5), and IHSS 197 will be investigated as part of IHSS 117.1 (OU 13). A Draft No Action Justification document was submitted to EPA and the CDPHE in March 1992. The document was revised upon receipt of comments from EPA and CDPHE, and the final was submitted in July 1992.

The revised final document was submitted to EPA and CDPHE in October 1992. The No Action Justification document was approved by the regulatory agencies and DOE in March 1993. To fulfill the requirements of the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and to complete the administrative process at OU 16, a Proposed Plan (PP), Corrective Action Decision (CAD), Record of Decision (ROD), and a RCRA permit modification will be completed. The PP and draft modification of the Colorado Hazardous Waste Permit for OU 16 was finalized and has been approved for public comment by the regulatory agencies and DOE. A public comment period for the PP has been completed. A public hearing/meeting was held December 8, 1993, concurring the Proposed Plan/Draft Permit Modification. A responsiveness summary address on public comments and questions is being prepared.

Future Plans

The CAD/ROD process was signed on October 28, 1994, closing OU 16. It is the first completion of an OU at the Rocky Flats Environmental Technology Site Environmental Technology Site.

TABLE I: OU 16 Individual Hazardous Substance Sites

IHSS	Site Name
185	Solvent Spill
192	Antifreeze Discharge
193	Steam Condensate Leak (400 Area)
194	Steam Condensate Leak (700 Area)
195	Nickel Carbonyl Disposal
196	Water Treatment Plant Backwash Pond
197	Scrap Metal Sites

TABLE II: OU 16 IAG Milestones Completed Through FY94

IAG Milestone Description	IAG Completion Original Date	Extension Date	Date Accomplished
Submit Draft No Action Justification Document	March 4, 1992		March 4, 1992
Submit Final No Action Justification Document	July 30, 1992		July 30, 1992
Submit Revised Final No Action Justification Document			October 16, 1992

SURFACE WATER MANAGEMENT

Introduction

Surface water management at the United States DOE Rocky Flats Environmental Technology Site located in Golden, Colorado, is managed by the DOE Rocky Flats Environmental Technology Site Field Office (RFFO) Environmental Protection Division. The offsite water protection initiative and some onsite water management improvements are being funded under the Environmental Restoration (ER) Program.

Description

The quality of surface water at Rocky Flats Environmental Technology Site has caused concern to local communities, DOE, EG&G, federal and state regulators, and the public because two major water supplies, Great Western Reservoir and Standley Lake, are located directly downstream of Rocky Flats Environmental Technology Site. This concern has resulted in a complex network of regulations, agreements, and procedures for water quality treatment and management at Rocky Flats Environmental Technology Site.

A working group was formed in the summer of 1989 at the request of Congressman David Skaggs (2nd U.S. Congressional District) to address water management options at the plant. The working group selected an alternative, referred to as "Option B Plus J" or "Option B with Selected Onsite Improvements," for long-term management and disposal of surface water. This management alternative includes offsite water management projects (Option B) associated with the Great Western Reservoir Replacement Project and the Standley Lake Diversion Project which will further reduce the potential for water-borne contaminants from Rocky Flats Environmental Technology Site to affect local drinking water supplies. Also included are Onsite Water Management projects (Option J) aimed at improving pond dam safety and operations, upgrading effluent treatment capabilities, improving site drainages and flood control, and minimizing downstream discharges of waters.

Currently, discharges from the Rocky Flats Environmental Technology Site surface water ponds are managed under the Clean Water Act/NPDES permit. These surface water discharges do not pose a risk to human health or the environment and normally meet or exceed most local water quality standards.

DOE and EG&G were initially notified by EPA in December 1991, June 1992, and October 1992, that the new NPDES permit would apply only to the discharges from the wastewater treatment plant outfall while discharges from the ponds would be regulated under CERCLA through an Interim Measure/Interim Remedial Action (IM/IRA). The justification of EPA's position was that the "treatment" (apparently even natural settling/clarification processes) was not allowable in "waters of the U.S." This natural settling occurs and is readily acknowledged since the ponds were intentionally designed and constructed as storm water clarifying impoundments and as emergency spill catchment basins to reduce the spread and associated risk of health and environmental impacts to downstream communities. DOE formerly initiated dispute resolution in November 1992 and withdrew same in November 1992.

Major Contaminants

Plutonium and other radionuclides have been identified in Rocky Flats Environmental Technology Site onsite pond sediments and in the offsite reservoir sediments downstream of Rocky Flats Environmental Technology Site. Various other unspecified contaminants may be present in the plant surface water, Great Western Reservoir, and Standley Lake.

Description of Work Completed

Offsite Water Management (Option B)

DOE has publicly committed to funding the Option B offsite projects in order to further reduce potential risks to the water supplies of the cities of

Broomfield and Westminster, Colorado. A $20 million grant was paid by DOE, funded jointly by Defense Programs (DP) and Environmental Management (EM), to Broomfield and Westminster in FY91 and FY92 to begin planning, environmental assessments, engineering/design work and water rights purchases. An additional $40 million was granted by EM to the cities in FY93. Milestones accomplished through FY93 for the Great Western Reservoir (GWR) Replacement Project include analysis of portions of the GWR shoreline samples for plutonium and interpretation of results; final permits, final design, and site acquisition efforts have begun for the pipeline from Carter Lake to Broomfield; and hydraulic modeling studies for modifying Carter Lake outlet works were completed by the U. S. Bureau of Reclamation. Final design for the Carter Lake outlet works was completed. A site was selected for the new water treatment plant and the preliminary design has begun. Broomfield released a request for proposals for its water rights sale and new water rights purchases.

The Standley Lake Protection Project accomplishments include the removal of the diversion canal from the project because of local neighborhood opposition and constraints resulting from a nearby bald eagle nest.

The draft biological assessment for the project has been submitted to the U.S. Fish and Wildlife Service. Once a biological opinion is given, the Section 404 permit will be submitted to the U.S. Army Corps of Engineers. The Human Health Risk Assessment (HHRA) was completed for the construction of the project. Discussions with Jefferson County on the purchase of open space land for the reservoir are ongoing. The cities continue to pursue the construction of the reservoir offsite as the most expedient choice at this time.

Onsite Water Management (Option J)

Accomplishments include development of an updated project scope for the South Interceptor Ditch Repair Project which reflects significantly lower cost and fewer environmental impacts, completion of Title II Design for the environmental monitoring station installations; completion of Title II Design for the Pond C-2 Discharge Minimization (Pond C-2 Recycle); completion of the Drainage Repairs and Improvements Plan; completion of the Final Geotechnical Analysis for Dam Upgrades report; installation of additional safety monitoring instrumentation for terminal dams; initiation of offsite wetland mitigation for plantwide projects; completion of several drainage project scopes and cost estimates; completion of a scope and cost estimate for the Electric Power to Ponds Project; completion of an updated draft for the Surface Water Drainage Systems Environmental Assessment ; and as directed by DOE request or because of a lack of budget support and drivers the removal of several Option J projects from the Activity Data Sheet. The removed projects include the construction of a new treatment facility capable of treating low levels of radionuclides, the Sewage Treatment Plant Effluent Recycle Project, the Additional Walnut Creek Storage (Dam A-5) Project, the Increased Dam A-4 Storage Project, and the pursuit of additional discharge minimization projects. In addition to these removed projects, the Electric Power to Ponds and Pond C-2 Discharge Minimization Projects are both on indefinite hold pending either further DOE,RFFO guidance or selection of a Pond Water Management IM/IRA alternative that warrants pursuit of these two projects.

Pond Water Management IM/IRA

A Draft Pond Water IM/IRA Decision Document was submitted to EPA and CDPHE on November 22, 1993. Both agencies accepted the submittal, but rejected the status quo IM/IRA that was proposed. The proposed status quo IM/IRA was consistent with the NCP, CWA, and IAG. It is stated in the IAG that if the agencies do not agree with the proposed IM/IRA, they may select their own IM/IRA in accordance with applicable laws and the IAG. Specifically, elements of the CWA were applicable but ignored by the agencies, and interpretations differed between the agencies and DOE concerning legal status of the ponds and Paragraphs 31, 36, 40, 79, 80, and 150 of the IAG. Therefore, DOE formerly reopened dispute resolution in January 1994.

The Dispute Resolution Senior Executive

Committee met on April 15, 1994, and ended the dispute by signing a two-page, six-point document. The dispute resolution clarified the following issues: OU 7 will expedite landfill leachate remediation, tankage for spill control will become a milestone under the Industrial Area IM/IRA, Pond Water Management IM/IRA Decision Document administrative controls will apply to downstream of the stormwater outfalls and shall not become effective until the issuance of the new NPDES permit. Options for pond water management and compliance to stream standards will be left to the negotiation between the regulatory agencies and stakeholders. All penalties associated with the dispute were waived.

A Final Draft Pond Water Management IM/IRA Decision Document was submitted to the EPA and CDPHE on October 14, 1994. It was stipulated by the agencies that the new NPDES permit was to be on a concurrent track with the Pond Water IM/IRA Decision Document so they could be submitted for public comment and finalized at the same time. DOE and EG&G contended that they could not coordinate the two documents without receiving a draft of the new NPDES permit. The new NPDES permit draft was finally presented by EPA to Rocky Flats Environmental Technology Site on March 3, 1994. At the request of EPA, DOE and EG&G submitted their comments on the draft NPDES to EPA on March 28, 1994. To date, there has been no other action toward finalization of the new NPDES permit.

Future Plans

Offsite Water Management (Option B)

Great Western Reservoir Project

Construction will be completed on the raw water transmission pipeline from Carter Lake to Broomfield. Construction on the modification of the Carter Lake outlet works will be completed, and final design and construction of the new water treatment plant will be completed.

Standley Lake Diversion Project

A 404 permit will be submitted to the Corps of Engineers. Final design and final land acquisition for the Woman Creek Reservoir will be completed, and construction will be accomplished. Piping for the Kinnear Ditch project will be installed.

Onsite Water Management (Option J)

The Dam Upgrades Project for terminal Dams A-4, B-5, and C-2 will be completed. This includes scope and cost estimate development, detailed design, and construction for several project components including upstream gate installations for the outlet works and downstream slope drains/buttresses. Also the installation of an upstream gate for the Dam A-3 outlet works is included. As part of the Dam Upgrades Project, inclusion of upstream slope drains/buttresses may depend on a final Pond Water Management IM/IRA alternative selection.

The Surface Water Drainage Systems Environmental Assessment (EA) will be completed. This EA covers most drainage projects. This includes the South Interceptor Ditch Repair Project.

The South Interceptor Ditch Repair Project will be completed. This includes design and construction.

Flood proofing projects for Buildings 991 and 444 will be completed. This includes design and construction.

A detailed scope and cost estimate will be finalized for the North Walnut Creek Industrial Area Drainage Improvement Project, the South Walnut Creek Flood Prevention Project, the Pond A-1 Bypass Improvement Project, and the Woman Creek Bypass Upgrades Project. Design and construction will follow.

Support for investigations and pilot testing of advanced low-level radionuclide treatment technology will continue.

Pond Water Management IM/IRA

Concurrent with the new NPDES permit, the Draft Final Pond Water Management IM/IRA will be submitted to the public for the required 60-day comment period. A Final Responsiveness Summary will then by prepared; and following regulatory agency approval, a Final Pond Water Management IM/IRA Decision Document will be released.

The finalization of the Pond Water IM/IRA Decision Document will result in a requirement to implement a specific pond water management alternative or combination of alternatives. A Biological Assessment (BA) will then be prepared to determine the associated specific environmental impacts, concerns, and potential mitigations required for endangered species under the implementation plan. Following consultations, the BA will be submitted to the U.S. Fish and Wildlife Service for its biological opinion.

TABLE I: Water Projects

Offsite Projects (Option B)

A) Standley Lake Interceptor Canal
B) New Woman Creek Reservoir
C) New drinking water source and water treatment plant for the city of Broomfield

Onsite Projects (Option J)

A) Dam upgrades
   - Downstream Slope Drain/Buttress (Dams A-4, B-5, and C-2)
   - Upstream Gates on Outlet Work (Dams A-3, A-4, B-5, and C-2)
   - Upstream Slope Drain/Buttress (Dams A-4 and B-5; contingent upon Pond Water Management IM/IRA alternative selection)

B) Site Drainage Repairs and Improvements
   - South Interceptor Ditch Repair Project
   - South Walnut Creek Flood Prevention Project
   - North Walnut Creek Industrial Area Improvements Project
   - Pond A-1 Bypass Improvements Project
   - Woman Creek Bypass Improvements Project
   - Flood Proofing Projects for Buildings 444 and 991

C) Radionuclide Treatment Technology Development

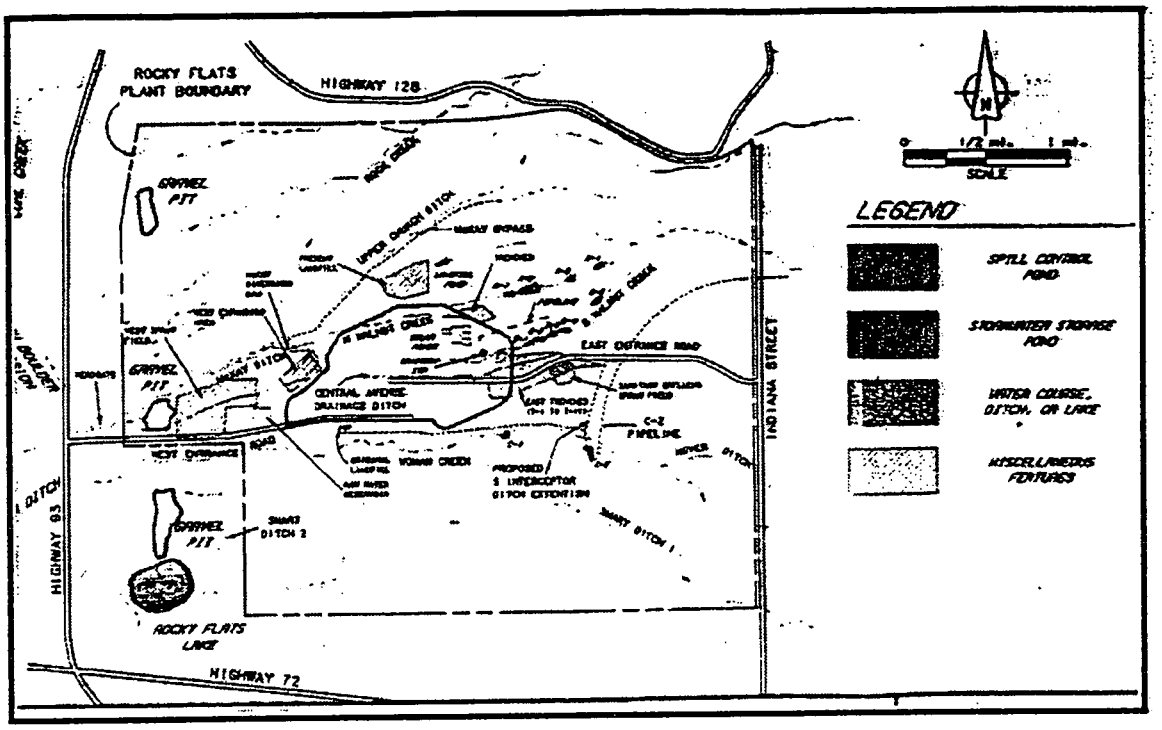

FIGURE 1: Upstream and Onsite Surface Water Features

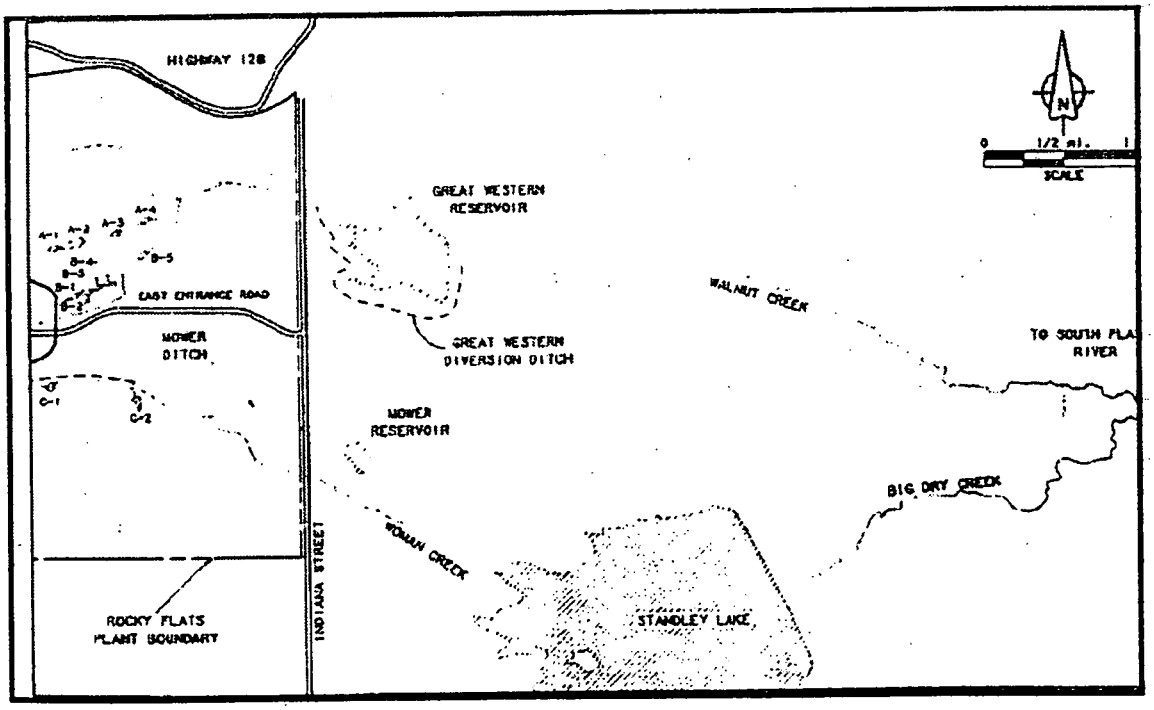

FIGURE 2: Downstream Surface Water Features